22. An apparatus as in claim 1 wherein the stationary portion, moving portion, or both, have a rigid structure.

23. An apparatus as in claim 1 wherein the detection means includes a stress sensor in response to which the assistance is provided and a movement sensor in response to which the resistance is provided.

24. An apparatus as in claim 1 further comprising a low battery warning indication coupled to the control means and communicated to a user by a vibration mode of the actuator.

25. An apparatus as in claim 5 further comprising means for recording measurements associated with joint movements in the monitor mode.

26. An apparatus as in claim 1 wherein the apparatus fits and can be worn under a person's garment.

27. An apparatus as in claim 1 wherein the actuator is mechanically coupled with a gear or belt for exerting the force.

28. An apparatus as in claim 1 configured as a knee assistance and rehabilitation device.

29. An apparatus as in claim 1 wherein transitioning from de-energizing to energizing, and vice-versa, of the actuator is controllable to dampen such transitions and prevent a joint from buckling.

30. An apparatus as in claim 1 further comprising a regenerative braking circuit coupled to a power supply for absorbing any external force induced on the actuator by the joint movement.

31. An apparatus as in claim 1 wherein the actuator is a DC motor, servomotor, or gear motor.

32. An apparatus for controlling joint movement and reducing muscle stress, comprising

a first fastening means;

a second fastening means;

a stationary portion coupled to the first fastening means;

a moving portion coupled to the second fastening means, the stationary and moving portions being attachable proximate to a joint of the human body with the first and second fastening means, respectively, and participating in movements of the joint;

detection means operative to detect joint movements and muscle stress;

an electrostatic actuator operative, when energized, to exert force between the stationary and moving portions; and

control means responsive to the detection means for controlling the energizing and de-energizing of the electrostatic actuator, wherein the energizing is controllable for directing the force so that, when assisting, the force reduces the muscle stress.

33. An apparatus as in claim 32 wherein the energizing is further controllable for directing the force so that, when resisting, the force opposes joint movement.

34. An apparatus as in claim 33 having user selectable modes of operation, including assist and resist modes.

35. An apparatus as in claim 34 wherein the user selectable modes further include an idle mode.

36. An apparatus as in claim 34, wherein the user selectable modes further include a rehabilitate mode.

37. An apparatus as in claim 34, wherein the user selectable modes further include a monitor mode.

38. An apparatus as in claim 32, wherein the electrostatic actuator has a stationary component and a moving component movably mounted proximate to the stationary component and capable, when the actuator is not energized, of moving freely in a plane substantially parallel to the surface of the stationary component.

39. An apparatus as in claim 32 wherein the electrostatic actuator is configured as a rotary actuator in which the moving and stationary components share an axis running through their midpoints around which the moving component rotates clockwise or counter clockwise depending on the joint movement.

40. An apparatus as in claim 32 in which the electrostatic actuator is coupled to both the stationary and moving portions to facilitate the assistance or resistance with extension and flexion associated with the joint movement.

41. An apparatus as in claim 32 being configured with an exoskeletal frame for attachment to a limb above and below the joint such that the electrostatic actuator is located on a lateral side of the limb.

42. An apparatus as in claim 32 wherein the electrostatic actuator is coupled to the stationary portion, moving portion, or both, at a location proximate to a pivot point of the joint.

43. An apparatus as in claim 32 wherein the electrostatic actuator is configured with two portions one of which being capable of moving in a plane substantially proximate and parallel to the other, each portion having a plurality of electrodes which in the portion capable of moving are connected to ground and in the other portion are electrically connected in a predetermined order to a multi-phase driving signal for inducing an electrostatic field therebetween.

44. An apparatus as in claim 43 wherein the multi-phase driving signal is one of sinusoidal and pulsed.

45. An apparatus as in claim 43 wherein the portion capable of moving is supported rotatbaly over the other part.

46. An apparatus as in claim 32, wherein the electrostatic actuator has a stator made of a first plurality of two-dimensional structures stacked over each other and a moving part, made of a second plurality of two-dimensional structures stacked over each other and interleaved with the first plurality of two-dimensional structures of the stator such that adjacent two-dimensional structures are electrically isolated from each other.

47. An apparatus as in claim 46, wherein the moving part has at least one set of electrodes connected to a fixed voltage, and the stator has multiple sets of electrodes with each set independently switchable between high and lower voltages.

48. An apparatus as in claim 32 wherein the apparatus fits and can be worn under a person's garment.

49. An apparatus as in claim 32 wherein transitioning from de-energizing to energizing, and vice-versa, of the electrostatic actuator is controllable to dampen such transitions and prevent a joint from buckling.

50. An apparatus as in claim 1 further comprising a regenerative braking circuit coupled to a power supply for absorbing any external force induced on the electrostatic actuator by the joint movement.

51. A method for movement control with a powered device, comprising:

fastening a powered device at points above and below a joint, the powered device having an actuator;

setting a desired mode of operation of the powered device;